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THE
MAMMARY SIGNS
OF
PREGNANCY
AND OF
RECENT DELIVERY.

BY

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TO

ALFRED MEADOWS, Esq., M.D.,

ASSISTANT PHYSICIAN-ACCOUCHEUR, AND FOR DISEASES OF WOMEN AND CHILDREN TO KING'S
COLLEGE HOSPITAL; PHYSICIAN-ACCOUCHEUR TO ST. GEORGE'S DISPENSARY.

MY DEAR DR. MEADOWS,

May I claim permission to inscribe the following pages to you? This favour will add to the many acts of kindness and encouragement I have already received from you, whilst it gives me a means of publicly thanking you for them.

Gratefully, yours,

J. LUMLEY EARLE.

February 24th, 1862.

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PLATE 1.

Fig. 1.



Fig. 2.

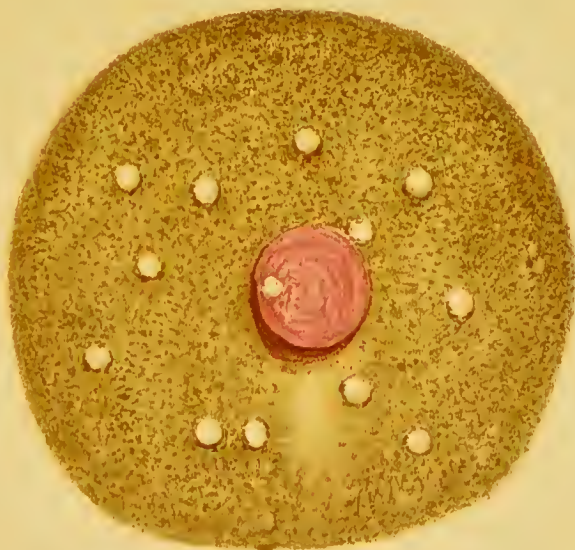




Fig 3



Fig. 4



Fig. 5.



Fig. 6.



ON THE MAMMARY SIGNS OF PREGNANCY AND OF RECENT DELIVERY.

THERE are few subjects more interesting or more important to the medical observer than the study of the signs of pregnancy; interesting, inasmuch as it gives us an insight into the numerous and complicated changes which result from conception,—that mighty mystery which has baffled successfully, and probably will until the end of time, the piercing scrutiny of the most eminent physiologists; important, inasmuch as it affords us a means, with few exceptions, of detecting the guilty, clearing the innocent, and even saving life.

The uterus and the mamma are the two organs from which we derive our most important diagnostic signs of pregnancy; but those only which are afforded by the latter are intended to be considered here.

It is, indeed, very surprising and difficult to explain, except by theory, how the breast is so materially affected by changes going on in the uterus. That an organ, placed external to the bony framework of the chest, and thus isolated, as it were, from the other organs of the body, should undergo so numerous and such curious alterations as soon as a certain process commences in another organ, naturally leads us to infer that these changes are produced through a nervous connection or *sympathy* between those two organs. I think there can be no doubt that in pregnancy the mammae are affected by two stimuli, viz., the stimulus of conception, and the stimulus of uterine irritation; the former is by far the more powerful of the two, and, in fact, produces certain alterations in the breast which no amount of uterine irritation could effect; however, the latter stimulus does assist in producing some of the minor changes. Unfortunately it is from an erroneous and exag-

gerated idea of the importance of the alterations produced by uterine irritation that medical practitioners are afraid of placing more dependence on the breast signs of pregnancy. I intend, therefore, briefly to consider the importance of making the mammary signs of pregnancy a special study.

In forming an opinion from the alterations in the breast, we employ our eyes and fingers, and the two senses of vision and touch require to be taught as much in the diagnosis of the breast signs as they and the other senses do in the diagnosis of other organic changes. No amount of book work, or diligence in attending lectures, will enable us to give a decisive opinion as to whether a woman is *enceinte* or not from the examination of the breast alone. It is only after the careful and minute examination of a large number of breasts that we can attain sufficient confidence to form an opinion from the mammary changes. If the breasts of a dozen women were to be examined successively, they would probably be found to differ very much from each other; for example, the breast of one woman who was in the third month of pregnancy might present an areola an inch and a half in diameter; while another presented an areola only an inch wide in the last month of gestation; then the next two, one pregnant and the other not, might possess follicles on the areola; while another *enceinte* presented none, and so on. It is only, therefore, by tutoring the eye to know the appearance of the different signs as observed in nature, the numerous variations which they are liable to undergo, and their relative value, that we can give an opinion with any amount of confidence. Then, again, to have a correct idea of the changes which conception effects in the mamma, we must know practically the appearance of the breasts of women who are *not* pregnant, whether they may be virgins or otherwise; for how can we tell the breast of a woman who is *enceinte*, if we do not know the appearance of the mamma of those who are not in that condition.

A thorough practical knowledgo of the mammary signs is

also very essential, as in many instances we cannot obtain an internal or vaginal examination. The unmarried girl generally accedes, without much hesitation, to the mammary examination, but declines, with feigned disgust and indignation, that of the vaginal; and the question will remain for time to determine, unless it can be proved by the signs apparent in the breast. Then, again, in the case of the woman who feigns pregnancy for various purposes, she also refuses a vaginal exploration; or, if she allows one, wriggles about and presses the examining arm between her legs, or screams so violently that practitioners generally desist from making any further attempts, believing that the vagina is morbidly sensitive. Then, again, surely it would be more to our credit, and more congenial to the sensitive feelings of woman, that we should be able to diagnose her condition from the examination of the breast alone. There are a few cases, of course, where the signs are doubtful one way or the other, and in these instances a more extensive investigation is proper and necessary.

The practical knowledge of the breast signs is also important, because they are the earliest noticeable, except that of arrested menstruation. Two months after conception has taken place, the mamma begins to be influenced by that powerful stimulus, and at three months, in many instances, there is present conclusive evidence of the pregnant condition existing.

Most medical men have abundant opportunity of examining the breasts of women, pregnant or not. All practitioners who attend midwifery have an easy and efficient means of observing the breast signs for themselves; for the examination of the breast and areola in the first visit after delivery is as valuable as before. If a medical man examines the breast only when his opinion is asked for, or when his suspicions are aroused as to the probability of pregnancy, his experience (though his practice might be ever so extensive, and even that of a life-

time) will be comparatively small in questions of this kind ; but if he avails himself of every opportunity of examining the breasts of his midwifery patients before or after delivery, as also of patients not pregnant, his experience will be large, and obtained in a short space of time.

A very common expression employed by medical men in speaking of the breast signs in questions of pregnancy which have come under their notice, is, that they were very " faintly marked." Now, I cannot help suspecting that in many of these instances there was some conclusive sign of pregnancy present ; we must not study so much to find out the signs which are absent in the breast, as those which are *present*, and especially the conclusive signs ; for example, a woman may present herself to you with a small breast ; an areola an inch in diameter, and faint in colour ; the veins indistinct ; but around the base of the nipple are noticed four or five of that peculiar variety of follicles which I shall hereafter describe as characteristic of pregnancy. This breast cannot be said to be faintly marked, though to a superficial observer it might appear to be so. Many of the usual signs are certainly either absent or faintly marked in this case, but there is present a conclusive sign, which as it is quite sufficient of itself to prove the existence of pregnancy, is therefore all that we require.

I will conclude these preliminary remarks by stating, that in questions of pregnancy both breasts should be examined, especially where there is any doubt about the matter, as very often the areola is very much more strongly marked in one than the other. The cause of this, in many instances, is not evident ; while in others, the destructive effects of previous inflammation and abscess, or of burns, clearly explain the reason of the dissimilitude.

The mammary signs of pregnancy are very numerous, and differ very much in importance ; some are conclusive, others are not ; in other words, some are produced only by the stimulus of conception, others by other vital stimuli also.

Those signs which I shall first consider may be termed the minor mammary signs, such as the enlargement; the pain in the breast; the increased size of the veins; and the white streaks or scars produced by distension of the breast. The major signs are, the changes in the primary areola, the secondary areola, and the presence of milk. Some coloured lithographs are appended to illustrate the different varieties of follicles, and the appearance of the areola after delivery.

ENLARGEMENT OF THE BREAST.

Before a girl arrives at the age of puberty, the breast resembles very much that of the opposite sex, is small, and almost even with the surface of the thorax, but as soon as she has arrived at ovarian maturity, evidenced by the discharge of the menstrual fluid, the mamma gradually enlarges, and becomes conical in shape, having the apex of the cone turned slightly outwards. When pressure is applied to such a breast the plumpness is found due more to a deposit of adipose tissue, and an increase of fluid in the meshes of the areolar tissue, than to actual enlargement of the proper gland structure. When conception takes place the mamma increases still further in size, but this second enlargement is produced by the growth of the secreting portion of the breast; the shape becomes more hemispherical, and on pressing the mamma between the thumb and first two fingers a peculiar nodulated mass will be felt, which is often tender when the pressure is slightly increased.

In estimating the value of the increased growth of the breast as a sign of pregnancy, we must study separately the value of the senses of sight and touch which must be employed in this sign.

The mere enlargement as apparent to the eye is of no value in a diagnostic point of view, for a breast may enlarge from so many causes. In virgins before the age of twenty the breast is as I have said, small and conical in shape, but after that age

the breast is very liable to become hypertrophied, without the stimulus of conception. The menstrual function produces more or less enlargement according as it is performed with or without pain, and therefore the hypertrophy increases with the age of the woman. The largest breasts I have ever seen existed in the person of a poor, thin, pinch-faced, half-starved Irishwoman, thirty years of age, in her first pregnancy; and, in answer to a question I put to her as to whether the breasts had attained their enormous size during pregnancy, she said that they had always been large, and volunteered the remark that they had increased in size at every menstrual period. Unmarried women who do not wear stays generally have very fine breasts; these instances are generally noticed amongst the poorer classes; nature is allowed to have her own way, and the result proves the improper restraint which stays produce upon the natural growth of the mammary organ. In stout women the breasts prove no exception to the rest of the body, and contain a large amount of adipose tissue. Hypertrophy of the mamma from a redundancy of fat is very often noticed in women about the "change of life." Women in robust health, as a rule, have larger breasts than those of weakly constitution.

The above-mentioned are some of the most frequent of the normal causes of enlargement of the mamma; but the hypertrophy may be due to many abnormal conditions. Any uterine or ovarian disease may produce an increased growth of the breast, such as amenorrhœa, dysmenorrhœa, uterine polypus, &c. These facts prove that an enlarged breast examined merely by the eye is of no value as a diagnostic sign; and as a woman may have a large breast without being pregnant, so also on the other hand the breast may be small and yet pregnancy exist. Sometimes in primiparæ the breast is small; as also in cases where great restraint is imposed upon the mammæ by tight stays. Montgomery mentions an instance in which no change was observed until the fifth day

after delivery, and then arose from general debility. A similar case came under my notice in which the breast was small and almost even with the surface of the thorax, and though the patient had had many children no apparent enlargement took place in that organ until after delivery. In this case there was no assignable cause.

Gardien and Mahon assert that swelling and pain are not observable in women who menstruate during the early months of pregnancy. This assertion I cannot agree with, for after the examination of a large number of cases on this point I cannot find that menstruation has the least effect in preventing swelling and pain of the breast. Only the other day a patient of this institution (General Dispensary), whom I attended in her second confinement, told me that she menstruated regularly for the first five months of her first pregnancy, and she suffered most intensely from tension and pain in the mamma. In the unimpregnated condition, menstruation, as is well known, tends, if anything, to enlarge the breast, and why pregnancy should reverse this practical fact, it is difficult to conceive; as far as I have been able to judge, it has no such effect.

The knowledge which we obtain by means of the fingers is of far greater importance as regards this sign than the mere inspection by the eye. The breast should be pressed between the thumb and two first fingers; at first the structure feels soft and elastic, consisting merely of fat and cellular tissue; then we feel the proper gland structure, which is more or less enlarged, and imparts to the touch a characteristic knotty and nodulated sensation. The breast of a woman not pregnant feels soft and cushiony, the thumb and the first fingers almost meet in the centre of the breast; in cases of enlargement of the breast produced by disease of the generative organs, the characteristic knotty feel of the breasts is generally wanting. In fat breasts the amount of adipose tissue is found to be enormous in comparison with the proper gland structure.

The breasts of primiparæ are generally compact and

braced up, and pregnancy produces in these a feeling of firmness which is not so much noticed in subsequent pregnancies. The mammæ of multiparæ, according to the number of children, and the length of time they suckle them, gradually lose the plumpness and tonicity of the primiparous mamma, and are liable to hang down and appear flabby, the same thing happens if, instead of holding their infants well up to the breast, they allow them to drag upon it. I have generally noticed that the knotty structure is remarkably well felt in flabby breasts. The effect of suckling upon the appearance of the breast is well known amongst women; and I have known instances of unmarried girls declining to suckle their illegitimate infants merely from fear of losing the rotundity and plumpness of the breast. It must be remembered that the hypertrophied condition of the gland is kept up by lactation, and more or less for some time after the child has been weaned. This characteristic knotty sensation imparted to the fingers is, I believe, a most important sign, though of course a decisive opinion given from the absence or presence of this sign alone would be very rash, yet when taken in conjunction with others it is of the greatest assistance in confirming our opinion.

PAIN.

Many women suffer more or less from pain in the mamma during pregnancy, and describe their sensations in various terms, as formication, itching, heat, pricking, a sensation of fulness, or throbbing. The various sensations are referred to the *margin* of the areola, sometimes are confined to the nipple (mastodynia), while in severer cases the pain darts through the breast "like a knife." These sensations may be so slight as hardly to draw the attention of the patient to them, while in others the pain is so great that the rest is disturbed, and is sometimes almost unbearable. Women generally doctor these pains by rubbing their breasts with oil, and holding them by the fire. The mastodynia of pregnancy is

very similar to that occurring in boys and girls about the age of puberty. It is especially annoying, as every movement of the chemise causes an accession of pain. The uneasy sensations in the breast are most frequently limited to the early months of pregnancy, commencing from the eighth to the twelfth week ; in other instances the pain is not felt until the last month or two of gestation, and in a few cases lasts during the whole period of pregnancy. The value of this sign taken by itself is very small, as in many instances the pain is absent during the whole period of gestation, while in others this sign is not felt until the last month or two, when our opinion is not so often required ; then again, uterine affections sometimes produce pain in the mamma,—cancer, for example. Dr. Simpson mentions a very interesting case of a lady whose breast had been heroically treated for severe pain in it, when the uterus, and not the breast, was the offending organ. She was suffering from malignant disease of the uterus. Severe dysmenorrhœa is very liable to produce pain in the mamma. The situation of the pain seems to me of some importance, for in pregnant women, as I have already mentioned, the uneasy sensations are most frequently referred to the margin of the areola, while, in uterine disease, the pain is described as acute, and darting through the breast. This sign increases vastly in importance when taken in conjunction with the knotty feel of the breast.

ENLARGED VEINS

are very often observed meandering over the surface of the mammary gland in pregnancy, and is a sign of some considerable importance, as the fatty breast or uterine affections produce very slight, if any, enlargement of the veins. The veins take a direction towards the areola, where they are more visible than at the circumference of the breast. The largest and the greatest number of veins are generally noticeable on the sternal side of the breast, and in some cases a regular

plexus of veins can be seen in the skin covering the sternum. As the veins approach the areola, they divide and subdivide, and join each other, so as to form a venous plexus with large meshes. Sometimes two or three large venous branches are noticed traversing the area of the areola, and these are generally of considerable size. Venous branches traversing the areola are so characteristic of pregnancy, that I almost feel tempted to consider them as conclusive evidence.

The size of the veins vary in different cases: in some they are very faintly marked, while in others their calibre is so large as to raise perceptibly the integument. The veins are much larger in the flabby breast than in the small and compact, and the reason seems obvious: in the relaxed tissues of the flabby mamma the calibre of the veins can attain to a much larger size than in the compact and firm, where some considerable amount of compressing force is kept up. The veins are more clearly marked in the breast of a fair woman than in that of the brunette. In many cases the veins are not observable at all, and therefore their absence is no evidence of the non-existence of pregnancy.

WHITE STREAKS OR SCARS.

This important and conclusive evidence of a present or former pregnancy, unfortunately, is more often absent than present. The scars consist of silvery lines of different lengths, and are situated in the outer and middle thirds of the breast. They converge from the circumference to the centre like the spokes of a wheel. A primipara, in whom they commenced in the fourth month, explained to me the manner in which they were produced. In the evening, perhaps, she would feel an itching in some portion of the breast, and next morning one of the white scars presented itself exactly over the spot where the itching was felt on the preceding evening. Every now and then the process was repeated.

When present, the scars or white streaks are conclusive

evidence of pregnancy existing at the time, or at some preceding period. It was formerly considered that these scars were produced only after delivery, from distension of the breast with milk ; but Montgomery and subsequent observers have incontestably proved that though they may be produced by lacteal distension, yet that they are produced oftener *during* pregnancy. In order to distinguish whether they are the products of a present or of a former pregnancy, the history of the individual, and especially the appearance of the mamma and areola, must be carefully studied.

The signs at present mentioned increase in importance when taken in conjunction with those which remain for our consideration, and when observed in women who have never been pregnant before. As a general rule it would be rash and unadvisable to give a decisive opinion from the presence of these signs alone ; though there are, I believe, a few instances in which a medical man thoroughly and practically conversant with the breast signs might do so. Fortunately the cases are rare in which the minor signs are alone present ; generally one or more of the major or more conclusive signs come to our assistance, and thereby prevent our powers of diagnosis from being so severely taxed. The major signs are of much higher value, since they are, with certain exceptions, produced by the stimulus of conception only.

THE PRIMARY AREOLA.

Around the nipple of the male and female breast is a circular disc, varying in colour from a light pink to a dark brown. The diameter of the areola in the male varies from half to three-quarters of an inch, that of the virgin from three-quarters of an inch to an inch and a quarter, and the woman who has had children, but is not pregnant at the time of observation, from one to two inches.

Sir Astley Cooper has clearly shown that the structure of the areola is very different from that of the surrounding skin,

for it consists of a number of papillæ which “are disposed in circles, their bases fixed in the cutis, and the apex of each is directed towards the nipple, so that they are opposed to the papillæ of the lips of the child. They are very vascular and sensitive bodies.” The sensitive structure of the areola not only promotes the natural desire on the part of the mother to suckle her infant, but also excites an afflux of blood to the mammary organ, and through that means an increased lacteal secretion.

In a great number of cases of pregnancy the areola increases gradually in diameter from the commencement to the close of gestation, but not with the regularity generally supposed. Observations of the breasts of pregnant women, carried on for a very short space of time, will show how extremely variable is the diameter of the areola. It is not at all uncommon to find the areola at the close of pregnancy only an inch in diameter, and as much as an inch and a half in other cases at the third month. In many instances the areola does not increase in width from the commencement to the termination of pregnancy. In a few cases at the close of gestation the areola is as much as three inches and a half in diameter. A rather interesting and not unimportant point to consider is the manner in which the increase in diameter is effected. Is it effected by a circumferential deposition of pigmentary matter, or by a stretching process of the structure of the areola? There is no doubt that it is by the latter means that the increase of diameter takes place, for the following reasons:—

1. The areola is a different structure from the surrounding skin.

2. If the increase of diameter took place from a circumferential laying down of a pavement of pigment matter, the increase would depend chiefly upon the depth of the colour of the areola. If the areola was of a pink hue, showing a deficiency of pigment granules, we should expect to find the diameter almost the same from the beginning to the end of ges-

tation; and, on the other hand, if the areola was almost black, the increase in width should be very striking; but the diameter is not at all affected by the colour. I have seen an areola three inches in diameter at the close of pregnancy, the colour of which was even lighter than the surrounding skin—in fact, it was white.

3. The white spots of Montgomery (secondary areola of Dubois), when present, become visible about the fifth month, and are situated immediately around the circumference of the areola; and though the diameter of the areola goes on still increasing in many cases to the close of pregnancy, we never see the secondary areola included within the precincts of the primary, which would be the case if the diameter increased by circumferential deposit of pigment.

The areola, in the great majority of primiparæ at the close of pregnancy is of less diameter than usual, showing not only that the diameter increases during pregnancy, but that up to a certain point it increases still further during subsequent pregnancies. There are exceptions to these remarks, for I have seen a few primiparæ with areola even three inches in width, but they have all had large breasts. In these instances the areola, with the rest of the cutaneous surface of the breast, had undergone a very rapid and unusual amount of extension. The areola, after delivery, does not return to its virgin width, unless the interval between one pregnancy and another has been of some years' duration. The increased width of the areola is an important sign of pregnancy in the latter half of gestation, and in primiparæ. In the earlier months the increase is so slight that we could not say whether the diameter had increased or not; this sign is more important in primiparæ, because in them the increase takes place for the first time, and accordingly is more conclusive. At subsequent periods a woman may have an areola two inches in diameter, and yet not be pregnant.

The depth of the colour of the areola is known to depend

very much upon the amount of pigment granules deposited in other parts of the body. In brunettes all the cutaneous tissues are more or less filled with black pigment; and in these cases the areola is generally very dark. In women with dark hair the areola may be of a pink colour, but the instances are rare indeed in which the complexion is dark and the areola of so light a hue. I attended a Jewess, however, in her confinement in whom the colour of the areola was pink. On the other hand, blondes, almost without exception, have a very light-coloured areola from the commencement until the end of pregnancy. I have never seen a single instance of a blonde having a very dark-brown areola at the close of gestation. The colour increases in depth from the third to the ninth month.

The areola of virgins sometimes has a considerable amount of colour, depending upon various causes—as the complexion, and the manner in which the menstrual function is carried on. Age influences the colour of the areola, as well as the size of the breast, probably through menstrual sympathies. The colour is more important in primiparæ than in multiparæ, because in the former the colour is produced for the first time; and though a great deal of pigment matter is removed after delivery, and in a very rapid manner (as I shall subsequently describe), still a considerable amount of colour is left; we cannot, therefore, depend so much upon the colour in subsequent pregnancies. If a woman has been four or five years without conceiving again, the darkened areola assumes an importance almost equal to that which it possesses in the first pregnancy.

During pregnancy the surface of the areola presents different appearances in different individuals. It may appear harsh and dry, wrinkled, smooth and shining, or “emphysematous.” The two former appearances are of no value as signs of pregnancy, as they are noticed in women who are not *enceinte*. The wrinkled areola denotes the existence of previous distension, and is therefore observed in women who have borne children. A *smooth shining surface like polished mahogany* is, I believe,

indicative either of pregnancy, or a sign that the woman is suckling. This polished appearance is often absent, but its absence does not set aside the possibility of pregnancy. A raised condition of the areola is an extremely valuable sign, and Montgomery describes it as "a soft and moist state of the integument, which appears a little raised above the surrounding skin, and in a state of turgescence, giving one the idea that, if touched by the point of the finger, it would be found emphysematous. This state appears, however, to be caused by infiltration of the subjacent cellular tissue, which, together with its altered colour, gives us the idea of a part in which there is going forward a greater degree of vital action than is in operation around it." This valuable sign is very often absent. Dr. Churchill states that he has invariably noticed it in primiparæ; but I have seen a few exceptions to this statement. However, it certainly is more often noticeable in first than in subsequent pregnancies.

THE NIPPLE

affords us little or no assistance in the diagnosis of pregnancy. It is represented by many as becoming turgid and prominent, and no doubt it does in many instances; but this turgidity does not impart any peculiar appearance which will enable us to say whether it is produced by pregnancy or not. The nipple in some cases increases very much in width and length during gestation, while in other instances no increase takes place; and I have seen virgins with nipples as large as many women who have borne children. In primiparæ generally the nipple is small and flat, projecting but little. This is partly due to the unused condition of the mammary appendage, partly to the restraint of tight stays, and partly to the increased turgescence of the areola around. Obstetric practitioners know well the trouble and anxiety which the undeveloped nipples of primiparæ frequently give after delivery. The shape of the nipple differs much: in some it is conical, with the base attached and

the apex free (this is more commonly observed in virgins); or the base may be free and the apex of the cone attached, resembling a polypus. The polypoid nipple is only seen in women who have suckled, and is not common, but is admirably adapted for sucking, as the infant is enabled to hold the nipple in its mouth without much effort. In other instances the attached and free portions of the nipple are of the same diameter, and after a woman has had one or two children the nipple is usually of this shape. The apex of the nipple in virgins is smooth, while in child-bearing women it has often a tuberculated appearance, like the mulberry, which is due to the hypertrophy of the sensitive papillæ with which the nipple is covered.

BRANNY SCALES ON THE APEX OF THE NIPPLE.

Montgomery seemed to consider branny scales on the nipple as conclusive evidence of pregnancy, but I have seen them on the nipples of a few virgins and in women not pregnant. I explain these anomalous instances in the following manner:—Women of the lower classes are well known to be very dirty in their habits, for they sometimes allow a month or more to elapse without washing the upper part of the chest and breasts. During this period a serous fluid exudes from the nipple, produced by the sympathetic irritation of menstruation, or uterine disease; but the quantity exuded is so small as not at first to be appreciable to the sight, and is not sufficient to be visible even by expression. The aqueous portion of the fluid rapidly evaporates as it exudes, and the solid portion is left in the form of scales. The accumulation of these scales is allowed to go on, until it is sufficiently great to become apparent to the eye. In women who have had children, milk is well known to linger in the breasts a long time after weaning, and is more liable to be reproduced under slight exciting causes; therefore in multiparæ it would not be difficult to understand how branny scales could be formed without pregnancy. However, not-

withstanding, these exceptional cases, there is no doubt that branny scales are very important when present in large quantities, and when a slight quantity of the serous fluid can be expressed from the nipple.

THE SECONDARY AREOLA.

This term was first applied by Dubois to a peculiar appearance of the skin situated immediately around the areola. Montgomery, who first noticed this sign, describes it as “numerous round spots, or small mottled patches of a whitish colour scattered over the outer part of the areola, and for an inch or more all round, presenting an appearance as if the colour had been discharged by a shower of drops falling on the part.” This appearance is produced by the deposit of pigment matter between the sebaceous glands of the skin of the breast, commencing immediately around the circumference of the areola, and extending outwards more or less in different women. In women of dirty habits the mouth of the sebaceous glands can be readily seen, from the presence of a black dot in the centre of each white spot, which black speck is the mouth of the sebaceous gland plugged up by dirt, as depicted in Plate I., Fig. 1. In this figure a semicircle only of white spots has been sketched, but in nature the circle is generally complete; sometimes one side of the circle is more distinctly marked than the other.

The secondary areola, as a general rule, does not consist of more than one or two rows, but this depends very much upon the colour of the hair and complexion; for while in blondes the white spots are generally absent, in brunettes very often they extend for four or five rows. I have seen a few primiparæ in whom the whole extent of the breast, external to the primary areola, was covered with the white spots. It was really beautiful to see the regularity with which they were disposed, proving their anatomical relation to the sebaceous glands. Every sebaceous gland present in the breasts of these

cases could have been counted with the naked eye. The secondary areola in these primiparæ was very dark, as would be expected from its great extent, in fact, was quite as dark as the primary areola, and the only line of demarcation between the two was the commencement of the white spots. Generally the secondary areola is of lighter colour than the primary. In many instances the white spots are not present, chiefly, as stated before, in women of fair complexion. I have noticed that the secondary areola is more often present, and more distinct in primiparæ than in multiparæ. There is no doubt that conception is the only stimulus which will produce this sign; and the reason is obvious, for the secondary areola to become noticeable the primary must have a considerable amount of colour, and this sign does not become visible until the fifth month, probably for the same reason that the primary has not attained until then, in the majority of instances, a sufficient depth of colour.

FOLLICULAR GLANDS.

The areola possesses certain peculiar follicles, which, in very many instances are of the greatest value to us in the diagnosis of pregnancy.

I have noticed five different varieties of follicles, to four of which, until better can be suggested, I have given the terms vesiculoid, pustuloid, papular, and mastoid.

The vesiculoid (Plate I., Fig. 1) resemble small vesicles existing in clusters of two, three, four, and five. Each cluster may be scattered indiscriminately over the surface of the coloured disk, but are for the most part observed at regular intervals from the nipple, so as to form a broken circle.

The pustuloid (Plate I., Fig. 2) are much larger, do not occur in clusters, but each follicle is placed promiscuously over the surface of the areola. The sebaceous material contained within them has often a slight yellow tinge.

The papular (Plate II., Fig. 4) are small, resemble little

pimples, may be present in considerable number, and are of the same colour as the areola, from not containing any sebaceous material.

The mastoid variety (Plate III., Fig. 5) are large, resemble little nipples, exist few in number, and are of the same hue as the areola, for the same reason as the papular.

The vesiculoid and pustuloid varieties are, I believe, conclusive evidence of pregnancy, while the papular and mastoid are not. It is the presence of the *sebaceous secretion* which affords this conclusive evidence, I have not seen a single instance in which any another stimulus, than that of conception has produced a similar secretion. Some works mention uterine hydatids as producing some of the mammary signs of pregnancy, and perhaps they may produce a secretion of sebaceous material, I cannot say whether they do or not; but if it should be subsequently ascertained that uterine hydatids do produce a similar appearance of the follicles, the value of the sign would not thereby be lessened, since they are merely one of the many forms of degeneration of the ovum, and therefore cannot exist without conception having previously taken place.

Papular follicles are often present in the male areola and in those of virgins; however, when observed in considerable number, they become important as a sign of pregnancy.

The mastoid variety, though no evidence of pregnancy existing at the time of observation, I have never noticed, except in women who have previously borne children. To show the value of the sebaceous material as an evidence of pregnancy, I will cite the following interesting case:—

“I was sent for one morning to attend a patient at the Dispensary in her confinement. In answer to a few preliminary questions I put to her, I learnt that she had not menstruated for the last ten months, and that she had been in pain during the whole night. While I was waiting for a pain to return, in order to examine the woman, a neighbour in the room at the time remarked that she did not think the patient was pregnant, as there was no “substance in the belly.” Whereupon, as the woman was in bed, I placed my hand upon

the abdomen, and applying gentle pressure, was enabled with the greatest facility to touch the tissues overlying the vertebral column. My first impression was, that she was not pregnant, but on examining the areola, I found it covered with the pustuloid variety of follicles. I then passed my hand over the suprapubic region, and readily felt the fundus of the uterus very tender to the touch. The diagnosis made at the time was, that the patient was in error as regards her having arrived at the full term of gestation, but that she was pregnant, and in about the end of the third, or commencement of the fourth month. There was no hæmorrhage at the time, but as the uterus was tender, and evidently inclined to contract, a large dose of opium was administered, which quieted the contractions for two or three days; they then again returned, and after the loss of about two pints of blood the ovum was expelled."

The fifth variety of follicles (Plate II., Fig. 3) is much more uncommon than those previously mentioned, but when present is, I believe, as conclusive as the vesiculoid and pustuloid. If the areola is examined merely superficially, these follicles escape our notice, as they do not project above the surface. The areola should be placed on the stretch by means of the thumb and first finger, as depicted in the drawing, and then, if present, the follicles will come into view. They lie close to the nipple, and resemble the ultimate saccules of a vesicular gland. In the article "Breast," by Mr. Solly, in the *Cyclopædia of Anatomy and Physiology*, edited by Dr. Todd, is an engraving taken from Sir. Astley Cooper's work on "The Anatomy of the Breast," and the foot-note appended describes it as a "tubercle filled with yellow injection, and twenty-three times magnified." The engraving represents exactly the follicles which I have just been describing.

During pregnancy the glandular follicles may present the character of the papular and mastoid, from an apparent absence of the sebaceous material; yet, if the areola is artificially attenuated in the manner already mentioned, the characteristic secretion very often becomes visible, and thus immediately removes any doubt we may have regarding the nature of the case. Therefore it is exceedingly important in questions of pregnancy, and especially where there is any doubt about the matter, to put the areola on the stretch. If no follicles are

visible at first, it may bring into view those depicted in Fig. 3 ; if follicles are present with an apparent absence of sebaceous material, very often this means enables us to see the characteristic secretion. The following case will show the importance of putting the areola on the stretch :—

“A patient of this Institution whom I accidentally saw, in consequence of the absence of one of the resident surgeons, gave me the following history of her case :—That she thought herself six months gone in pregnancy ; that a sanguineous discharge had been coming away from the commencement, but, under the treatment of the surgeon, the discharge had very much abated ; also, that the abdomen had decreased in size during the last month. She showed me a diaper covered with some fresh discharge, which was not sanguineous, but of a dirty brown colour, like a malignant discharge. There was a tumour in the lower part of the abdomen, which was evidently the uterus, but that it contained a foetus was anything but certain from the symptoms. On examining the breasts, I found the areolæ an inch in diameter, no secondary areolæ, and only a few follicles, which apparently contained no sebaceous material. However, on putting the areolæ on the stretch, the characteristic secretion at once came into view, and from this sign alone I inferred that the patient was correct in her supposition, which was verified about a fortnight after by her giving birth to a five-months’ putrid foetus.”

Gradually after delivery the sebaceous material is removed, and the follicles degenerate, as it were (if so grand a term may be applied to so simple a process), into those of the papular and mastoid, or are entirely removed, to again assume their characteristic appearance when the stimulus of conception recurs.

It is the opinion of some that these follicles communicate with the lacteal ducts. Morgagni, for instance, states that he has seen “lactiferous tubes going to each of these tubercles, and expanding within them, so that their formation was in a great degree caused by a dilatation of these ducts, and their prominence beyond the surface of the areola.” On the other hand, Sir Astley Cooper, in the same foot-note appended to the engraving before mentioned, says “these are the tubercles which have been supposed by anatomists to produce milk, and to have communication with the lactiferous tubes, from which, however, they are separate and distinct. They secrete a

mucous fluid, which has more the appearance of gruel than milk." I feel inclined, with all due humility, to side with the opinion of Sir Astley Cooper, for though no doubt Morgagni did see communications between the lacteal ducts and the follicles; probably they were the result of accident, produced during the necessary microscopical manipulations. Montgomery agrees with Morgagni, and further remarks, that in nurses the follicles have been observed to pour forth drops of milk, but he does not say that he has himself seen the follicles secrete milk. I have never observed any milk issue from them, and have asked women frequently if they have noticed any fluid, their answer has always been in the negative. I have pinched out the secretion contained within the follicles between two fingernails, but this proceeding required a certain amount of force, and produced slight pain before the thin capsule ruptured sufficiently to allow its contents to escape freely. Then, again, if there was a communication between the follicles and lacteal ducts, we should expect to find the follicles unusually prominent during lactation; however, this is not the case, for the follicular contents begin to be removed soon after delivery.

This disputed point bears not only an anatomical, but also a practical importance; because if the ducts and follicles do communicate, those medical men who think lightly of the milk test, will also esteem of little value the various forms of follicles which contain sebaceous material. They would argue, that if the breast may be stimulated to secrete milk without conception, so these cases might through the supposed communication become filled with lacteal secretion, and present the same peculiar appearance as they do in pregnancy. After delivery, the sebaceous secretion is removed more or less rapidly, whether lactation is kept up or not. The follicular secretion is removed more promptly in those women who do not suckle their children, but this is probably due not so much to the absence of milk as to the mammary organ being allowed

to assume almost suddenly the condition in which it existed before conception occurred. I had, perhaps, better cite an example to prove that lactation does not prevent the removal of the follicular contents. While I was visiting a midwifery patient, a woman stepped in and asked me to examine her legs, as the veins were getting enlarged and painful, she said that she had not menstruated for three months, but she did not think she could possibly be pregnant, as she had not weaned her child. On examining the breast, the areola was found to be an inch and a half in diameter, and covered with the pustuloid variety of follicles. In answer to a question as to how long the "pimples" had been present, she said they "have been there ever since my confinement fourteen months ago, but were not the same as they are now." I asked what she meant by "were not the same as they are now." She answered, "about a month or six weeks ago they were the same colour as this," pointing to the areola. I informed her she was pregnant, and she kindly consented to have the areola photographed; unfortunately, though three negatives were taken, they were all failures. This patient was confined prematurely of an eight months' child above five months after. I have seen instances where the sebaceous material has entirely disappeared in a month after confinement, though milk could be readily expressed from the nipple.

I believe the sole use of the follicles is to secrete a sebaceous material for the purpose of lubricating and keeping limp the surface of the areola, certainly not in any way to serve the purpose of Tom Thumb nipples. The follicles, contrary to the general opinion, do not increase in size after the third month, or so little as not to be appreciable. I have never been able to verify the following expression which is not unfrequently used, "the follicles increase in size month after month, until at the close of pregnancy they resemble little nipples." If those who should peruse this paper, will examine the coloured lithographs depicting the different varieties of follicles at any

period of pregnancy, I do not think they will come to the conclusion that they are like nipples. The fifth lithograph represents the mastoid follicles, but these are not characteristic of pregnancy. The follicles increase very often in number as gestation progresses.

If the follicles containing sebaceous material were always present, questions of pregnancy would be determined with facility, but they are often absent, and in a class of cases in which their presence would be welcome, viz., in primiparæ. I have noticed that in the majority of primiparæ the follicles are *entirely absent*, or in the few instances in which they are present, are indistinct. The instances are rare indeed of the *characteristic* follicles being present in the areola of primiparæ as large as are noticed in subsequent pregnancies. A few women have represented themselves to me as primiparæ, with large follicles on the areola, but their loose manner and appearance generally has produced a firm conviction in my mind that they had had previously personal experience of the throes of labour, and in one or two instances have confessed that the present pregnancy was not their first. However, because a woman represents herself as in her first pregnancy, and has a show of large follicles on the areola, we must by no means arrive at an immediate conclusion that she is not telling the truth, for I have seen one or two such cases, where there was no doubt that the women were primiparæ.

Though as a general rule the peculiar follicles are absent in primiparæ, first pregnancies are not so much more difficult to diagnose, because in them other signs are more often present, or are more conclusive than they are in multiparæ, *e.g.*, the unusual firmness of the breast, the increased colour and diameter of the areola, *the presence of milk*, and the emphysematous appearance of the areola.

Follicles are sometimes absent in women pregnant with the seventh or eighth child, and these are the cases which require more than usual care in diagnosing, for though there would

almost certainly be some of the mammary signs present, yet they may not be sufficiently conclusive to allow us to give a decisive opinion.

PRESENCE OF MILK IN THE BREASTS.

The value of this sign of pregnancy is at present a disputed point, for some medical men have no faith at all in the presence of milk in the breasts, either in primiparæ or in multiparæ ; others believe it is conclusive evidence in first and of considerable importance in subsequent pregnancies ; while others again consider the milk sign conclusive in primiparæ only. Dr. Peddie, of Edinburgh, who has written a most able paper on "The Mammary Secretion," in the *Monthly Journal of Medical Science*, for August, 1848, says he "feels convinced that the most invariable sign of gestation prior to quickening is to be found in the presence of fluid in the breasts," and has never found it fail in regard to those who were gravid for the first time, or in regard to those who were not pregnant at all." I perfectly agree with Dr. Peddie as to its importance in *primiparæ* ; its value is very much enhanced by the fact that in *primiparæ*, the follicles containing sebaceous material are generally absent. In subsequent pregnancies I do not place much reliance on the milk test, not only because milk is liable to remain in the breast for such a long time after weaning, or if entirely removed, to be re-excited by slight exciting causes ; but also because in *multiparæ* another sign conclusive as I believe, viz., the follicles containing a sebaceous secretion is generally present, and the history of the few cases related in this paper show that the follicular secretion becomes noticeable as early as the lacteal.

Some medical men who esteem lightly the value of the milk test in first, as well as in subsequent pregnancies, bring forward cases on record to show that women who have never been pregnant, or have not been so for many years, have suckled, and even that men have acted the part of the wet nurse. If we

examine into these cases we find that, in the first place, there are only about two dozen such cases on record, then in half of them the flow of milk has been produced by applying a child to the breast, and but about half a dozen cases remain, including men and women, in whom milk was produced without stimulation of some sort or other. So few as six instances in which a flow of milk was said to have been produced without stimulation, clearly seem to me to prove the value of the milk sign in primiparæ. Dr. Tanner, in his work on "The signs and Diseases of Pregnancy," after stating his reliance on the milk test in first pregnancies, very properly remarks "if there were reasons for believing that the girl had been stimulating the mammary glands by the application of any galactagogue, or by allowing the nipples to be sucked by an infant, I should reject the evidence afforded by the existence of a few drops of milk; but girls who come to us to be cured of amenorrhœa, though they may have been unable to curb their passions, have not unusually been anxious to prematurely develop their breasts."

To bring the milk to the apex of the nipple, the thumb and first digit of the right hand should be placed on the breast, about two inches apart, one on each side of the nipple, then first press them firmly on the breast, and lastly bring them forward to the nipple with an alternate side to side expressing movement. The thumb and finger should use some compressing force until they arrive at the nipple, when a gentle squeeze being applied to that mammary appendage, from one to three drops of a colourless fluid will generally become visible on the apex of the nipple. If no fluid is observed repeat the process two or three times, as the amount of milk in the early months of gestation is very small. It requires a little knack and care to bring the milk to the apex of the nipple, and it is a very good plan first to sponge the nipple with a little warm water, for very often the openings of the lacteal tubes are plugged up by dirt, or by the solid remains of the natural secretion dried up from evaporation.

As the fluid expressed from the nipple during pregnancy is colourless, and to the naked eye not at all like the milk after parturition, the aid of the microscope is required to prove its nature. Dr. Beale's pocket microscope is very useful for examining milk at the bedside, for a drop of milk placed on a slip of glass soon dries up, and therefore requires to be examined on the spot. I do not think I can do better than give the microscopic appearances of milk during the early months of pregnancy, in the words of Dr. Peddie. "When submitted to the microscope the characteristic globules will at once be detected, and these will be seen agglomerated *en masse*, the solid portion being at this period in a large ratio to the fluid, which latter is also peculiarly glutinous. Mixed with these groups will be perceived an abundance of large oil globules and colostrum granules, as in the green milk of recent parturition. There are sometimes found also a few epithelial lamellæ, which have been separated from the lining membrane of the excretory ducts, and which have either not been transformed into colostrie masses, or if this has been so they have already parted with their mucoid and granular contents." I beg to refer those who are desirous of studying the subject of the microscopic signs of milk to Dr. Peddie's excellent treatise, to be found as already mentioned, in the *Monthly Journal or Retrospect of the Medical Sciences*, for August, 1848. The paper is replete with matter of vast importance to the community at large.

Having now concluded the description of the various mammary signs of pregnancy, I will pass on to consider briefly whether these signs will enable us not only to diagnose pregnancy, but also to declare how far pregnancy has advanced. I am of opinion, that valuable as the breast signs are in the diagnosis of pregnancy, they assist us but little in determining the period of gestation at which a woman has arrived. If the areola were very dark in colour in comparison to that of the hair and complexion, and there were four or five

rows of white spots present, or if the whole breast were covered with them, we might give a pretty good guess that the patient was in the eighth month of pregnancy at least; if, on the other hand the secondary areola consisted of one or two rows only, or if white scars were present, we could merely state that the patient was in the latter half of gestation, but we could not decide in such an instance whether she was in the fifth or the following months. Then again, suppose there were no secondary areola or white scars we could not say, except in rare instances, owing to the liability of the areola to vary in diameter and colour, whether the patient was in the third or the last month of gestation. I previously remarked that the areola in some cases at the third month measures as much as an inch and a half in diameter, while in the last month, in other instances, it measures only an inch; also that the follicles do not increase in size after the third month. A very common question asked in midwifery examinations is to describe the appearance of the breast at the sixth month, which evidently implies that it is considered possible to tell how far a woman has gone in pregnancy from the examination of the breast, but if we keep in remembrance the fact of the variations of the diameter and colour of the areola, that the follicles are matured at the third month, and the frequent absence of the secondary areola and white scars, I think we must agree that such a question is not founded on practice, and is liable to confuse and produce doubts in the mind of an inexperienced practitioner; for if a medical man enters into practice with the idea that at such or such a month, the breast should present such or such appearances, his faith in the breast signs will soon be materially shaken.

In questions of recent delivery we employ the mammary signs indirectly, *i.e.*, we examine first the uterus by means of the abdomen and vagina, and having formed an opinion from that examination we then proceed to examine the breast in order to strengthen that opinion. But besides the common

mammary signs of pregnancy which are employed in cases of recent delivery, there is an appearance of the areola which I believe at present to be a direct sign of recent parturition; and as far as I know has never been described, at least the only reference to it is made by Montgomery, who says that Dubois saw an instance in which the cuticle of the areola peeled off, carrying with it the pigment scales; whether Dubois noticed this case before or after delivery, I cannot say, owing to my not having an opportunity of referring to his work, but this change is evidently considered exceptional, whereas it constantly takes place after delivery. Fig. 6 (in the last number of the *Review*) shows the appearance of the areola in which the process is going on in a marked manner after delivery. The inner third of the areola is shining, and very much paler in colour than the outer third; this appearance indicates that the desquamation is complete; the outer third is dark, in fact, of the same depth of colour as before delivery; it has also a harsh and dry aspect; the desquamation in this portion has not yet commenced; the middle third presents a patchy appearance, some parts resembling the inner third, while, in other portions, patches of cuticle with pigment scales are still in the course of removal, and, in fact, their detachment is easily affected by the finger nail. The desquamation takes place from the centre to the circumference, and, by degrees, the whole of the middle third assumes the pale shiny appearance of the inner; and the outer third, the patchy appearance of the middle, until the desquamation is completed, leaving the areola of a much lighter hue than before delivery. If the breast has not been employed for the purpose of sucking, either from the child having been stillborn, or from various other reasons, the cuticular desquamation also takes place from the centre to the circumference, but commences sooner and is completed in a much shorter space of time, if the child has been applied to the breast. The entire cuticle may be removed in twelve hours, but five days is the average time which elapses

before the change is completed. In some instances, where the areola is dark, or its diameter wide, the process is ten days in being perfected.

The appearance of a few areolæ which I have been fortunate enough to have had the opportunity of examining a day or two before delivery, has been harsh, dry, and scaly, as if they had assumed a condition preparatory to the change, which takes place after the completion of parturition. Fig. 6 shows the change going on in a marked manner, but, in many instances, merely a few branny scales near the circumference of the areola can be seen, to indicate that the change is taking place, and the grades of distinctness lie between the few branny scales on the circumference of the areola to the well-marked changes depicted in Fig. 6. In a great many cases, this change does not take place, or at all events is not noticeable, probably in some cases from the colour of the areola being too light to produce a sufficient contrast between its various portions, or the completion of the process before the examination was made. However, as the change is not noticeable in many cases, its absence is no criterion of a woman not having been recently delivered, but when present is, I believe, a conclusive evidence of her having lately given birth to a child, as I have not yet noticed a similar appearance except in such cases.

The following is a summary of the most important points connected with the mammary signs of pregnancy, and the relative value of each sign.

1. Both breasts should be examined.
2. Any of the mammary signs may be found absent in an individual case; but the instances are rare in which all the mammary signs are absent at the same time.
3. The mere enlargement of the breast as apparent to the eye is of no value in the diagnosis of pregnancy, while the sensation imparted to the finger by the hypertrophied condition of the proper gland structure is of considerable importance.

4. The pain is the least valuable of all the mammary signs.

5. The enlargement of the veins is a very important sign, especially when the enlargement is considerable, and above all when the veins traverse the areola; as far as I have at present noticed venous branches traversing the areola are characteristic of pregnancy.

6. The white streaks or scars are conclusive evidence of a present or former pregnancy, and in the generality of cases it is an easy matter to distinguish whether they are the products of a previous or present gestation.

7. The increase of the diameter is most important in primiparæ.

8. The increase of the colour of the areola is most important in the latter months of pregnancy and in primiparæ.

9. The raised condition of the areola is characteristic of pregnancy, and is most frequently present in primiparæ.

10. A shining appearance of the areola like polished wood is very characteristic of pregnancy.

11. The secondary areola is a conclusive sign, and is generally most distinctly marked in primiparæ.

12. The nipple is of no, or very slight, importance in questions of pregnancy.

13. The branny scales on the apex of the nipple, though not characteristic of pregnancy, are of great value if they exist in large quantities, and if a small amount of fluid can also be expressed from the nipple.

14. The mere projection of the follicles is of no importance unless they are present in a large number; but are conclusive evidence of pregnancy if they contain sebaceous material.

15. The areola should be placed on the stretch in doubtful cases; (*a*) because if no follicles are present, those depicted in Fig. 3 may be brought into view by this means; (*b*) if follicles are present with an apparent absence of the sebaceous matter, the artificial extension of the areola may make that secretion visible.

16. The follicles are seldom present in primiparæ.

17. In multiparæ the most important mammary sign during the early months of pregnancy, is the sebaceous-containing follicle.

18. In primiparæ the most important mammary signs during the early months are the presence of milk in the breasts, and the raised condition of the areola.

19. The mammary signs do not assist us much in determining the period of pregnancy at which a woman has arrived.



